

Name: _____

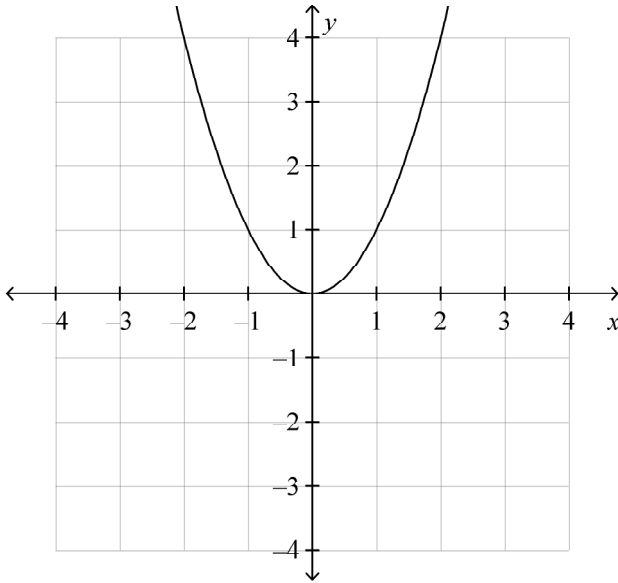
Class: _____ Date: _____

PreAssessment Quadratic Unit

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1 Identify the vertex of the graph. Tell whether it is a minimum or maximum.



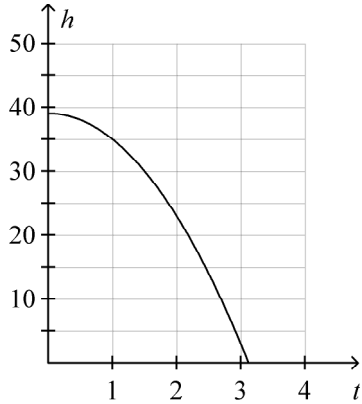
- A (0, 0); maximum C (0, 1); minimum
B (0, 1); maximum D (0, 0); minimum

- _____ 2 Which of the quadratic functions has the narrowest graph?

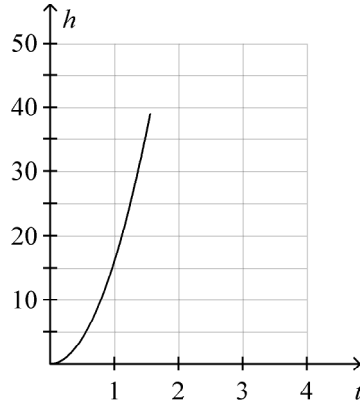
- A $y = -3x^2$ B $y = \frac{1}{7}x^2$ C $y = \frac{1}{3}x^2$ D $y = -4x^2$

- 3 If an object is dropped from a height of 39 feet, the function $h(t) = -16t^2 + 39$ gives the height of the object after t seconds. Graph the function.

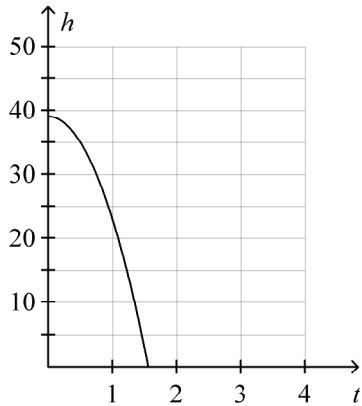
A



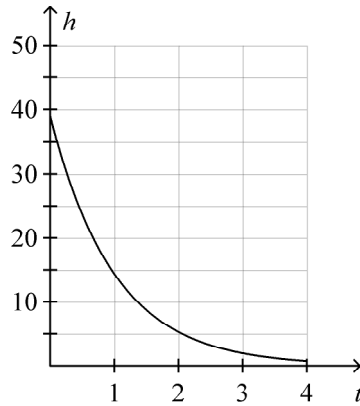
C



B



D



- 4 Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of

$$y = 4x^2 + 5x - 1$$

A $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 4\frac{5}{8}\right)$

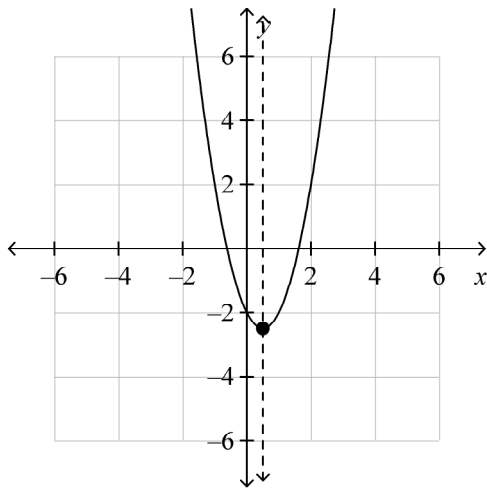
C $x = -\frac{5}{8}$; vertex: $\left(-\frac{5}{8}, -5\frac{11}{16}\right)$

B $x = \frac{5}{8}$; vertex: $\left(\frac{5}{8}, 3\frac{11}{16}\right)$

D $x = -\frac{5}{8}$; vertex: $\left(-\frac{5}{8}, -2\frac{9}{16}\right)$

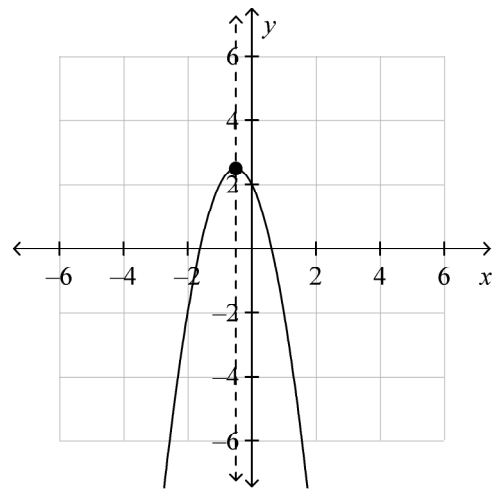
5 Graph $f(x) = 2x^2 + 2x - 2$. Label the axis of symmetry and vertex.

A



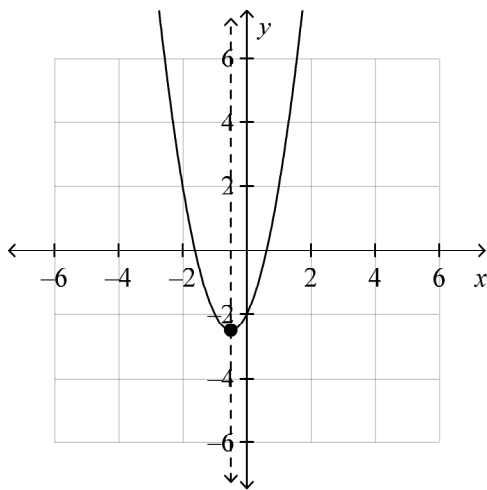
Axis of symmetry: $x = 0.5$
Vertex: $(0.5, -2.5)$

C



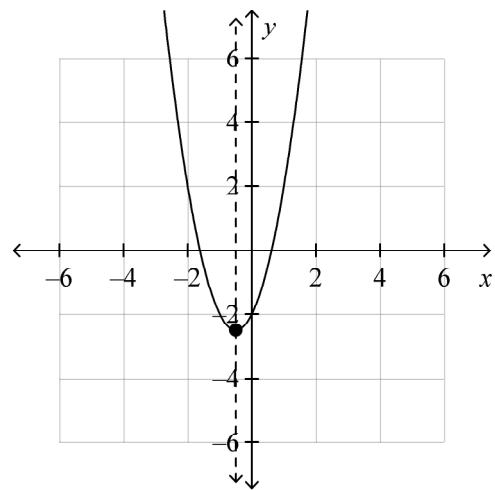
Axis of symmetry: $x = -0.5$
Vertex: $(-0.5, 2.5)$

B



Axis of symmetry: $x = -0.5$
Vertex: $(-0.5, 2.5)$

D



Axis of symmetry: $x = -0.5$
Vertex: $(-0.5, -2.5)$

_____ 6 Suppose you have 56 feet of fencing to enclose a rectangular dog pen. The function $A = 28x - x^2$, where x = width, gives you the area of the dog pen in square feet. What width gives you the maximum area? What is the maximum area? Round to the nearest tenth as necessary.

A width = 28 ft; area = 196 ft²

C width = 14 ft; area = 588 ft²

B width = 28 ft; area = 420 ft²

D width = 14 ft; area = 196 ft²

_____ 7 A ball is thrown into the air with an upward velocity of 48 ft/s. Its height h in feet after t seconds is given by the function $h = -16t^2 + 48t + 8$. In how many seconds does the ball reach its maximum height? Round to the nearest hundredth if necessary. What is the ball's maximum height?

A 1.5 s; 44 ft

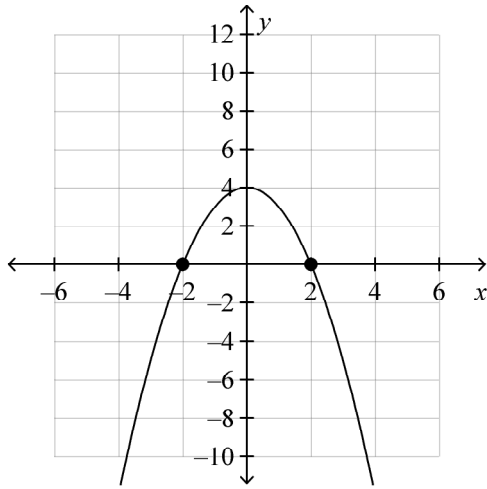
B 3 s; 8 ft

C 1.5 s; 116 ft

D 1.5 s; 56 ft

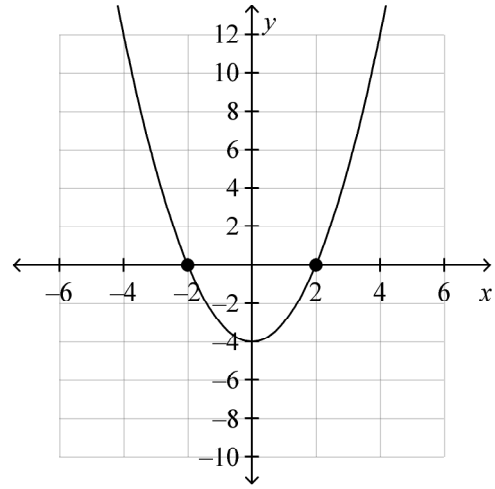
8 Solve $x^2 + 2 = 6$ by graphing the related function.

A



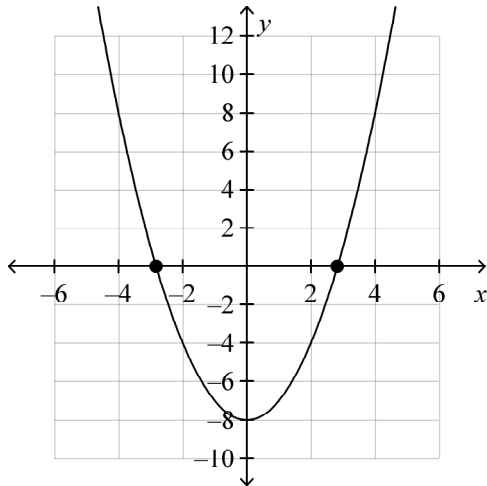
There are two solutions: 2 and -2.

C



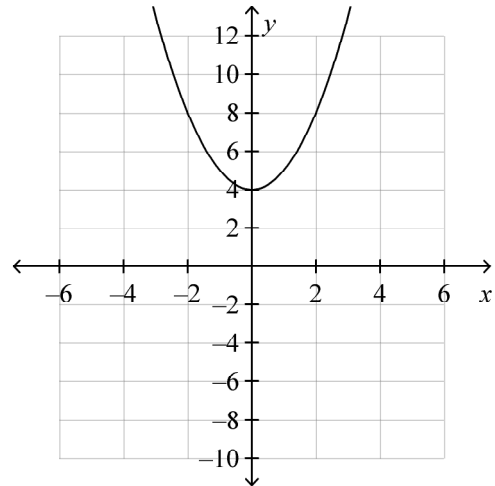
There are two solutions: 2 and -2.

B



There are two solutions: $\pm\sqrt{8}$.

D



There are no real number solutions.

Solve the following equations using square roots.

_____ 9 $x^2 - 15 = 34$

- A ± 7
- B 7

- C no real number solutions
- D ± 49

_____ 10 $x^2 + 20 = 4$

- A $\sqrt{24}$
- B -4

- C $\pm\sqrt{24}$
- D no real number solutions

_____ 11 Solve $(x-8)(4x+2) = 0$ using the Zero Product Property.

- A $x = -8$ or $x = -\frac{1}{2}$
- B $x = 8$ or $x = -\frac{1}{2}$

- C $x = -8$ or $x = \frac{1}{2}$
- D $x = 8$ or $x = \frac{1}{2}$

Solve the following equations by factoring.

_____ 12 $z^2 - 4z - 12 = 0$

- A $z = -6$ or $z = 2$
- B $z = -6$ or $z = -2$

- C $z = 6$ or $z = -2$
- D $z = 6$ or $z = 2$

_____ 13 $3z^2 + 17z + 20 = 0$

- A $z = -5$ or $z = 4$
- B $z = -1\frac{2}{3}$ or $z = -4$

- C $z = -5$ or $z = -4$
- D $z = -1\frac{2}{3}$ or $z = 4$

___ 14 $c^2 - 7c = 0$

A $c = 1$ or $c = -\sqrt{7}$

B $c = 0$ or $c = -7$

C $c = 0$ or $c = 7$

D $c = 0$ or $c = \sqrt{7}$

___ 15 The expression $ax^2 - bx = 0$ _____ has the solution $x = 0$.

A always

B sometimes

C never

Solve the following equations by completing the square.

___ 16 $x^2 - 6x = -15$

A $-3 \pm 2i\sqrt{6}$

B $3 \pm \sqrt{6}$

C $-3 \pm 2\sqrt{6}$

D $3 \pm i\sqrt{6}$

___ 17 $x^2 + 2x - 6 = 0$

A 2.24, 2.65

B -8, 6

C 1.65, -3.65

D 1.65, -3.65

Use the Quadratic Formula to solve the following equations.

___ 18 $2a^2 - 46a + 252 = 0$

A 18, 28

B -9, -14

C 9, 14

D -18, 28

___ 19 $x^2 + 6x + 18 = 0$

A 0, -6

B $-3 \pm 3\sqrt{3}$

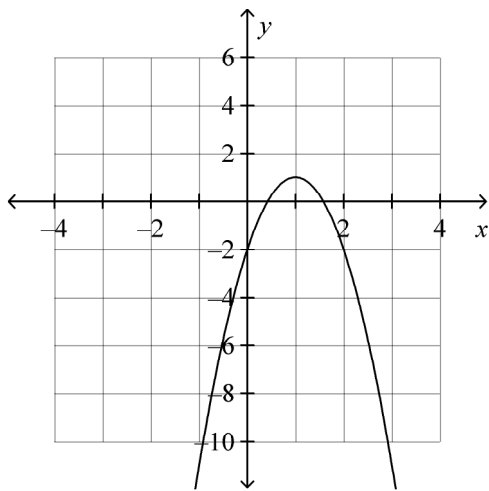
C no solution

D $-3 \pm 3i$

___ 20 A rocket is launched from atop a 56-foot cliff with an initial velocity of 135 ft/s. Substitute the values into the vertical motion formula $h = -16t^2 + vt + c$. Let $h = 0$. Use the quadratic formula find out how long the rocket will take to hit the ground after it is launched. Round to the nearest tenth of a second.

- A $0 = -16t^2 + 135t + 56; 0.4 \text{ s}$ C $0 = -16t^2 + 135t + 56; 8.8 \text{ s}$
 B $0 = -16t^2 + 56t + 135; 0.4 \text{ s}$ D $0 = -16t^2 + 56t + 135; 8.8 \text{ s}$

___ 21 For which discriminant is the graph possible?



- A $b^2 - 4ac = -9$ B $b^2 - 4ac = 0$ C $b^2 - 4ac = 4$

Find the number of real solutions for the following equations.

___ 22 $x^2 - 12x + 36 = 0$

- A 0 B 2 C 1

___ 23 $x^2 - 5 = 0$

- A 0 B 2 C 1

Use the following functions to answer the next set of questions: $f(x) = 3x - 2$, $g(x) = 3x^2 + 2x - 1$, $h(x) = 4x + 8$ and $k(x) = 2x^2 - x - 9$.

_____ 24 Find $\left(\frac{f}{h}\right)(2)$.

A 4

B $\frac{1}{4}$

C 2

D $\frac{1}{2}$

_____ 25 Find $f(x) \cdot h(x)$.

A $12x^2 + 16x - 16$

B $12x^2 - 16$

C $12x^2 + 32x - 16$

D $12x^2 + 32x + 16$

_____ 26 Find $g(x) + k(x)$.

A $-5x^2 - x + 10$

B $-x^2 - 3x - 8$

C $5x^2 + x - 10$

D $x^2 + 3x + 8$

_____ 27 Find $(g - k)(3)$.

A 24

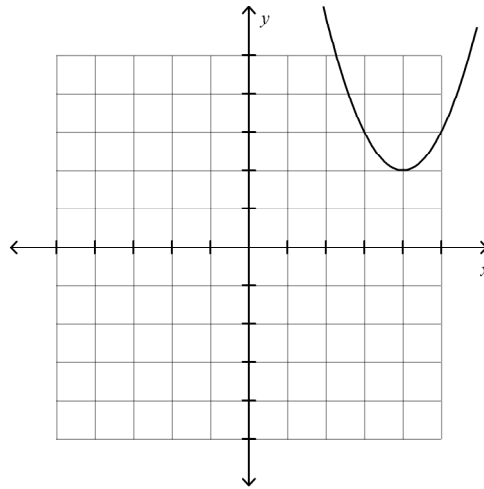
B 86

C 38

D 26

- _____ 28 Find the inverse of the function: $f(x) = x^2 - 4$. Is the inverse a function?
- A $f^{-1}(x) = x^2 + 4$; yes it is a function. C $f^{-1}(x) = \pm\sqrt{x+4}$; no it is not a function.
- B $f^{-1}(x) = \pm\sqrt{x+4}$; yes it is a function. D $f^{-1}(x) = x^2 + 4$; no it is not a function.
-
- _____ 29 Find the inverse of the function: $f(x) = (x-2)^2 + 3$. State the domain and range of the inverse.
- A $f^{-1}(x) = \pm\sqrt{x-3} + 2$
Domain: $\{x | x \in \mathfrak{R}\}$ Range: $\{y | y \geq 3\}$
- B $f^{-1}(x) = \pm\sqrt{x-3} + 2$
Domain: $\{x | x \geq 3\}$ Range: $\{y | y \in \mathfrak{R}\}$
- C $f^{-1}(x) = \pm\sqrt{x+3} - 2$
Domain: $\{x | x \in \mathfrak{R}\}$ Range: $\{y | y \geq 3\}$
- D $f^{-1}(x) = \pm\sqrt{x+3} - 2$
Domain: $\{x | x \geq 3\}$ Range: $\{y | y \in \mathfrak{R}\}$
-
- _____ 30 What transformation of the parent function, $f(x) = x^2$, is the function $f(x) = -(x+2)^2$?
- A Reflect across the x-axis and translate right 2. C Reflect across the x-axis and translate left 2.
- B Reflect across the y-axis and translate up 2. D Reflect across the y-axis and translate down 2.
-
- _____ 31 Write a function that represents the parent function, $y = x^2$, after it has been translated 3 up and 2 right.
- A $y = (x-3)^2 + 2$ C $y = (x+3)^2 - 2$
- B $y = (x-2)^2 + 3$ D $y = (x+2)^2 - 3$

___ 32 What function models the graph below?



A $y = (x+4)^2 + 2$

C $y = (x-4)^2 + 2$

B $y = (x+2)^2 + 4$

D $y = (x-4)^2 - 2$

___ 33 Use the second difference to determine which equation models the table below:

x	-3	-2	-1	0	1	2	3	4
y	28	12	0	-8	-12	-12	-8	0

A $f(x) = (x-4)(x+1)$

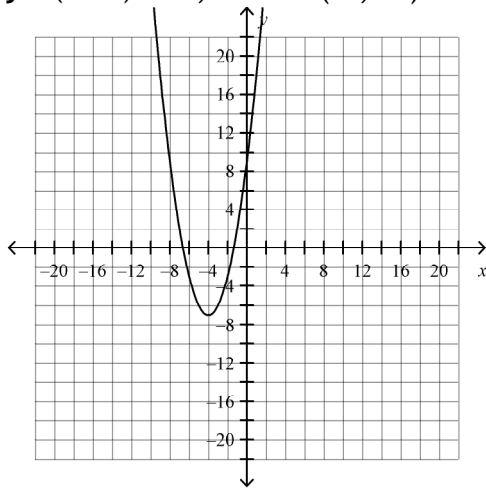
C $f(x) = 2(x+4)(x-1)$

B $f(x) = 4(x-4)(x+1)$

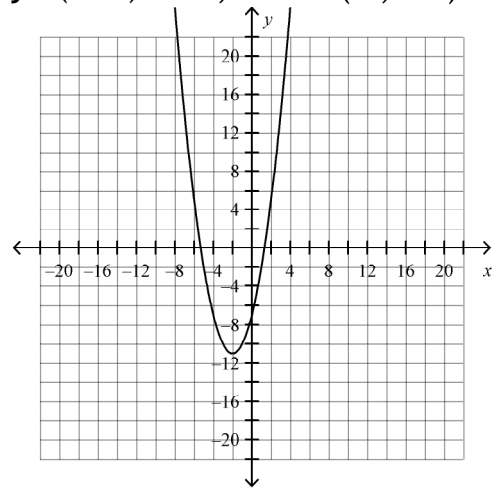
D $f(x) = 2(x-4)(x+1)$

___ 34 Convert $y=x^2+4x-7$ to vertex form, identify the vertex and the graph.

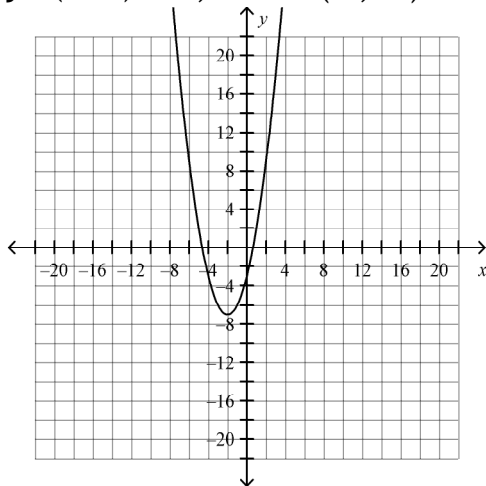
A $y=(x+4)^2-7$; vertex $(-4, -7)$



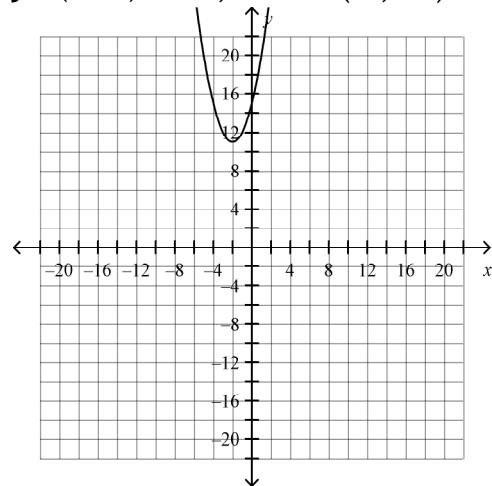
C $y=(x+2)^2-11$; vertex $(-2, -11)$



B $y=(x+2)^2-7$; vertex $(-2, -7)$

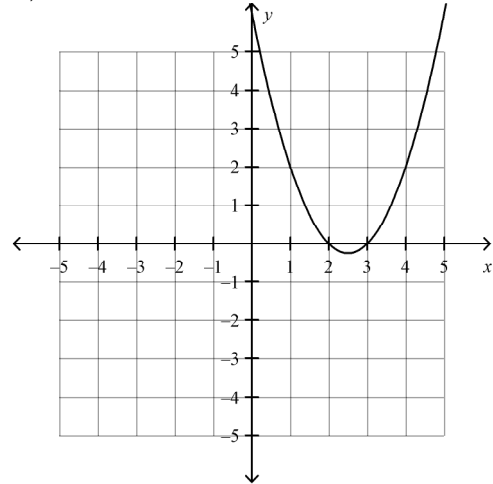
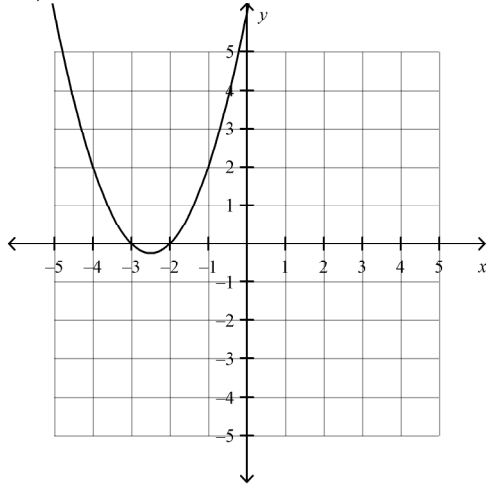


D $y=(x+2)^2+11$; vertex $(-2, 11)$



___ 35 Convert $y = x^2 + 5x - 6$ to factored form, identify the x-intercepts and the graph.

- A $y = (x + 3)(x + 2)$; x-ints (0, -3)(0, -2) C $y = (x - 3)(x - 2)$; x-ints (0, 3)(0, 2)



- B $y = (x + 6)(x - 1)$; x-ints (0, -6)(0, 1) D $y = (x - 6)(x + 1)$; x-ints (0, 6)(0, -1)

